

Animal Science Research Centre - Beef Unit Trial Results – 2009 (b)

Effect of concentrate feed level on the performance of maize silage fed bulls

Introduction:

Feed accounts for 75-80% of the variable costs of beef production. Intensively fed beef cattle are predominantly fed rations based on rolled barley and recent fluctuations in the price of cereals make it necessary to evaluate alternative feeds and high-energy forages. Maize silage is recognised as a high energy forage with good quality maize silage typically containing approximately 11.0+ ME MJ/kg DM with 30% starch. The objective of this experiment was to compare the effect of feeding either a low or high level of concentrate supplementation to maize silage fed dairy-bred bulls.

Stock:

36 Nov-Dec 2007 born dairy-bred bulls weighing 225kg @ 6 months old. There were 30 Holstein and 6 Limousin x Holstein bulls. Slaughtered Feb-April 2009.

Treatments:

75 Maize: 25 Concs

Ad libitum 75% maize silage DM (33.9% DM, 11.2ME, 30.5% starch) and 25% concentrate DM Total Mixed Ration (TMR) plus 150g/head/day minerals. Concentrate feed rate was approximately 2.5kg/head/day over the course of the trial.

50 Maize: 50 Concs

Ad libitum 50% maize silage DM and 50% concentrate DM TMR plus 150g/head/day minerals. Concentrate feed rate was approximately 5.4kg/head/day.

Concentrates were provided from rolled barley and rapeseed meal with the TMR's formulated to contain 14% CP/kg DM. Concentrates fed with the 75:25 ration contained 47% rolled barley, 47% rapeseed meal, 6% minerals. Concentrates fed with the 50:50 TMR contained 77.5% barley, 20% rapeseed meal, 2.5% minerals.

Results:

Table 1: Animal performance (kg/bull)

	75:25	50:50	s.e.d	Sig
Start wt	224	225	14.8	NS
Slaughter wt	587	585	9.4	NS
Days to slaughter	276	272	9.4	NS
DLWG	1.32	1.33	0.036	NS
Age at slaughter (months)	15.3	15.2	0.21	NS

Table 2: Carcase characteristics

	75:25	50:50	s.e.d	Sig
Carcase wt (kg)	295	296	6.4	NS
Kill out (%)	50.3	50.6	4.60	NS
Carcase DG (kg)	0.69	0.71	0.023	NS
Conformation¹ (1-7)	2.4	2.6	0.22	NS
Fat class¹ (1-7)	2.9	3.1	0.17	NS

¹ EUROP carcase classification: Conformation: P+=1 and E=7, Fat class: 1=1 and 5H=7.

Table 3: Feed intakes (kg) and Feed Conversion Ratio (FCR)

	75:25	50:50
Maize silage	5,029 (1,705kg DM)	3,843 (1,303kg DM)
Rolled barley	325	1,147
Rapeseed meal	325	292
Minerals	41.4	40.8
FCR (kg DM/kg gain)	6.39	7.20

The FCR's appears relatively high but it must be taken into consideration that the trial did not include the period of growth from 110kg to 225kg from 3 to 5½ months of age. During this rearing phase dairy-bred bulls at Harper Adams will typically record an average DLWG of 1.51kg with an FCR of 3.3:1 and get them to a size to utilise and cope with a forage based diet, despite at the time a relatively high price for barley. By 225kg the bulls are typically recording a DLWG of 1.8-1.9kg per day.

Table 4: Financial performance

(£/bull)	75:25	50:50
Carcase Value (March 2009)	787	791
Feed costs per bull¹	179	231
Feed cost/kg LW gain	0.50	0.64

¹ Feed costs: Maize silage @ £55/t DM; Rolled barley @ £95/t; Rapeseed meal @ £136/t; Minerals @ £256/t

Conclusions:

- Overall the bulls recorded performance that achieved recognised targets for silage beef production with slaughter weights of 575-600kg at 15-15.5 months of age whereas cereal fed Holstein bulls at Harper Adams typically reach slaughter weights of 550kg at 13-14 months old.
- Increasing the concentrate feed ratio from 25% to 50% of dietary dry matter intake with bulls fed **good quality** (11.0+ME, 30%+ starch) maize silage had no significant effect on animal performance.
- The bulls fed 75% maize silage recorded an increased margin worth £48 per bull with reduced feed costs per kg gain of 14p based on the costs prevailing at the time of the study. Based on March 2013 costings with maize silage @ £85/t DM, barley @ £172/t, rapeseed meal @ £245/t and minerals @ £350/t, feed costs per bull are £295 and £394 for the 75:25 and 50:50 rations respectively, i.e. £99/bull lower for the 75:25 ration.
- With the recent fluctuations in the price of cereals, good quality maize silage offers the potential to reduce feed costs however the delay in slaughter of 1.5-2 months needs to be taken into consideration.

Reference:

Marsh, S.P. 2011. Effect of concentrate feed level on the performance of maize silage fed bulls. *Proceedings of the British Society of Animal Science*. Paper 82